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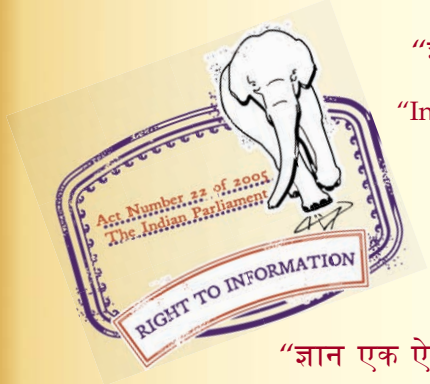
[MTD 19: Steel Tubes, Pipes abd Fittings]



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IS : 9295 - 1983
(Reaffirmed 1995)

Indian Standard

SPECIFICATION FOR STEEL TUBES FOR IDLERS FOR BELT CONVEYORS

(First Revision)

Third Reprint JULY 1997
(Incorporating Amendment No. 1)

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Indian Standard

SPECIFICATION FOR STEEL TUBES FOR IDLERS FOR BELT CONVEYORS

(First Revision)

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(*Continued on page* 11)

AMENDMENT NO. 2 NOVEMBER 2006
TO
IS 13428 : 2005 PACKAGED NATURAL MINERAL WATER — SPECIFICATION

(Second Revision)

[*Page* 4, *clause* **8.1**(a)] — Substitute the following for the existing:

'a) Name of the product (that is natural mineral water);'

(FAD 14)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 3 JUNE 2010
TO
IS 9295 : 1983 SPECIFICATION FOR STEEL TUBES FOR IDLERS FOR BELT CONVEYORS

(First Revision)

(*Page* , *clause* **18.1**) — Substitute 'embossed' *for* 'marked'.

(MTD 19)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR STEEL TUBES FOR IDLERS FOR BELT CONVEYORS

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 18 April 1983, after the draft finalized by the Steel Tubes, Pipes and Fittings Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 Steel tubes are extensively used as idlers for belt conveyors and the standard covering requirements for the same was first published in 1979. While reviewing the standard, it was felt necessary to issue a revision incorporating the following salient changes in the light of the experience gained in usage of the standard by the industry and the users.

a) Amendment No. 1, issued in September 1981.

b) Certain additional thicknesses and modifications to the requirements given earlier for ovality, eccentricity, straightness, tolerances on thickness, fin height, etc.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard covers the requirements for steel tubes for idlers for belt conveyors.

*Rules for rounding off numerical values (*revised*).

2. TYPES AND GRADES

2.1 Steel tubes for idlers for belt conveyors shall be of the following types (based on the process of manufacture and grades):

Types	*Grades*
Hot-Finish Seamless (HFS)	YSt 210, YSt 240 and YSt 310
Cold-Drawn Seamless (CDS)	YSt 210, YSt 240 and YSt 310
ERW (including HFIW)	YSt 210, YSt 240 and YSt 310

NOTE — The grades YSt 210, YSt 240 and YSt 310 correspond to grades 22, 25 and 32 specified in the original standard.

3. SUPPLY OF MATERIAL

3.1 General requirements relating to the supply of steel tubes for idlers for belt conveyors shall conform to IS : 1387-1967*.

4. DESIGNATION

4.1 Steel tubes are designated by the symbols to indicate the process of manufacture, followed by the minimum yield stress in MPa.

5. MATERIAL

5.1 The tube shall be made from the steel manufactured by open hearth basic oxygen, electric furnace, or any other process approved by the purchaser, or a combination of these processes.

6. MANUFACTURE

6.1 Tubes shall be manufactured by one of the following processes:

a) Seamless, and

b) ERW (including HFIW).

6.2 The height of the internal fin value of ERW pipes shall not exceed 1·7 mm.

NOTE — Lower limit of fin height may be as agreed to between the manufacturer and the purchaser.

7. CHEMICAL COMPOSITION

7.1 The ladle analysis of steel shall not have more than 0·06 percent sulphur and not more than 0·06 percent phosphorus and shall be carried

*General requirements for the supply of metallurgical materials (*first revision*).

out either by the method specified in IS : 228* and its relevant parts or any other established instrumental/chemical method. In case of dispute the procedure given in relevant part of IS : 228* shall be the referee method. However, where the method is not given in IS : 228* and its relevant parts, the referee method shall be agreed to between the purchaser and the manufacturer.

7.2 Check Analysis — When specified on the purchase order, a check analysis shall be made by the supplier. The permissible variation from the limits specified in **7.1** shall be as follows:

Constituents	*Percent, Max*
Phosphorus	0·005
Sulphur	0·005

8. MECHANICAL PROPERTIES

8.0 The following tests shall be carried out.

8.1 Tensile Test — This test shall be carried out in accordance with IS : 1894-1972† on one of the following, at the manufacturer's option:

a) A length cut from the end of the selected tube (the ends being plugged for grips or flattened where necessary), and

b) A longitudinal strip cut from the tube and tested in the curved condition.

8.1.1 The tensile strength, the yield stress and the percentage elongation shall be not less than those specified in Table 1.

TABLE 1 MECHANICAL PROPERTIES

Tube Designation	Tensile Strength MPa *Min*	Yield Stress MPa *Min*	Elongation Percent *Min*
HFS 210/CDS 210/ERW 210	330	210	20
HFS 240/CDS 240/ERW 240	410	240	18
HFS 310/CDS 310/ERW 310	450	310	15

8.1.2 The percentage elongation in this standard shall be reported with reference to a gauge length of $5{\cdot}65\sqrt{S_0}$ where S_0 is the original cross sectional area of the test specimen.

*Methods of chemical analysis of steels (issued in parts).
†Methods for tensile testing of steel tubes (*first revision*).

8.2 Drift Expansion Test — The test shall be carried out on a piece of tube approximately 100 mm long, cut from end of each selected tube in accordance with IS : 2335-1963* and the minimum increase in outside diameter after expansion shall be 2·5 percent. The included angle shall be 30°, 45°, or 60°, at the option of the manufacturer.

NOTE — The sizes which are not covered in IS : 2335-1963* shall be subject to agreement between the purchaser and the manufacturer.

8.3 Flattening Test — A ring not less than 50 mm in length, cut from one end of each selected tube shall be flattened between the two parallel plates in accordance with IS : 2328-1963† with weld at 45°, if any. No opening shall occur by flattening in the weld, until the distance between the plates is less than 75 percent of the original outside diameter of the pipe. No cracks or breaks in the material shall occur until the distance between the plates is less than 60 percent of the original outside diameter.

9. WEIGHT

9.1 The nominal mass and dimensions of black steel tubes shall be as specified in Table 2.

TABLE 2 DIMENSIONS AND NOMINAL MASSES OF BLACK STEEL TUBES

OUTSIDE DIAMETER	THICKNESS	MASS
(1)	(2)	(3)
mm	mm	kg/m
63·5	3·65, 4·50	5·39, 6·55
76·1	3·65, 4·50	6·52, 7·95
88·9	4·05, 4·85, 6·30	8·47, 10·05, 12·83
101·6	4·05, 4·85, 6·30	9·74, 11·57, 14·81
108·0	4·05, 4·85, 6·30	10·38, 12·34, 15·8
114·3	4·5, 5·4, 6·3	12·19, 14·50, 16·78
120·0	4·5, 5·4, 6·3	12·82, 15·26, 17·67
127·0	4·5, 4·85, 5.4, 6·3	13·6, 14·61, 16·19, 18·75
133·0	4·5, 4·85, 5·4, 6·3	14·3, 15·33, 16·99, 19·69
139·7	4·5, 4·85, 5·4, 6·3	15·0, 16·13, 17·89, 20·73
152·4	4·5, 4·85, 5·4, 6·3	16·4, 17·65, 19·58, 22·70
159·0	4·5, 4·85, 5·4, 6·3	17·1, 18·44, 20·46, 23·72
165·1	4·5, 4·85, 5·4, 6·3	17·8, 19·17, 21·27, 24·67
168·3	4·5, 4·85, 5·4, 6·3	18·2, 19·55, 21·69, 25·17
193·7	5·4, 6·3, 7·1	25·1, 29·12, 32·67
219·1	5·4, 6·3, 7·1	28·5, 33·06, 37·12

*Method for drift expanding test on steel tubes.
†Method for flattening test on steel tubes.

9.1.1 Outside diameters and thicknesses other than those covered under the standard will be permissible subject to agreement between the manufacturer and the purchaser.

10. HARDNESS TEST

10.1 When hardness values are required, the hardness values shall be as agreed to between the purchaser and the manufacturer.

11. NUMBER OF SAMPLES FOR MECHANICAL TESTS AND DIMENSIONS

11.1 **Mechanical Tests** — The number of pipes on which mechanical tests shall be performed are as follows:

a) *Up to and including 114·30 mm outside diameter* — One tube from a lot of 400 tubes or a fraction thereof as presented for inspection, and

b) *Over 114·30 mm outside diameter* — One pipe from a lot of 200 pipes or a fraction thereof as presented for inspection.

11.2 **Dimensions** — One tube from a lot of 100 tubes or fraction thereof as presented for inspection.

12. RETESTS

12.1 Should any one of the test pieces first selected fail to pass any of the tests specified, two further samples shall be selected for testing in respect of each failure from the same lot. Should the test pieces from both these additional samples pass, the material represented by the test samples shall be deemed to comply with the requirement of that particular test. Should the test pieces from either of these additional samples fail, the material represented by the test samples shall be deemed as not complying with the standard or the manufacturer may select to test individually the remaining lengths in the lot for the test failed to comply in the preceding tests.

13. TOLERANCES

13.1 Tubes shall conform to the following tolerances.

13.1.1 *Ovality* — It is defined as OD, *Max* — OD, *Min* and at any one cross section shall not exceed:

Below 168·3 mm	0·5 mm
Including 168·3 mm and above	1·0 mm

13.1.2 *Eccentricity* — Eccentricity at any cross section, when calculated by the following formula shall not exceed 5 percent:

$$\frac{t_{max} - t_{min}}{2 \times t} \times 100$$

where

t_{max} = maximum thickness,

t_{min} = minimum thickness, and

t = specified thickness.

13.1.3 *Mass*

a) Single tube (medium and heavy series) shall have a tolerance of ±10 percent, and

b) For quantities per load of 10 tonnes, *Min* the tolerance shall be ±7·5 percent (medium and heavy series).

NOTE — For the purpose of a minimum weighment of 10 tonnes lot, the weighment may be done in convenient lots at the option of the manufacturer.

13.1.4 The tolerances of HFS/ERW tubes shall be as under:

HFS/ERW	Tolerances
a) Outside diameter	±0·8 percent
b) Thickness	± 10 percent

13.1.5 The tolerances on CDS tubes shall be as under.

13.1.5.1 *Outside diameter* — Where the ratio of outside diameter to thickness is not greater than 33:1, the tolerances shall be as shown in Table 3.

13.1.5.2 For sizes larger than 127·0 mm outside diameter, the tolerance shall be ± (0·08 mm + 0·05 per 25 mm of outside diameter or part thereof).

13.1.5.3 Where ratio of outside diameter to thickness is greater than 33:1 the tolerances shall be as agreed to between the purchaser and the manufacturer.

13.1.5.4 *Thickness* — The tolerance on thickness shall be ± 10 percent.

14. WORKMANSHIP

14.1 All tubes shall be free from harmful defects, reasonably smooth and free from rust. Unless otherwise specified, ends shall be cut square. Surface finish shall be as agreed to between the manufacturer and the purchaser.

TABLE 3 TOLERANCES

All dimensions in millimetres.

Outside Diameter		Tolerance
Over	Up to and Including	
(1)	(2)	(3)
—	25·4	±0·13
25·4	38·1	±0·15
38·1	51·0	±0·18
51·0	63·5	±0·20
63·5	76·1	±0·23
76·1	88·9	±0·25
88·9	101·6	±0·28
101·6	114·3	±0·31
114·3	127·0	±0·33

15. STRAIGHTNESS

15.1 Unless other tolerances are agreed to between the purchaser and the manufacturer, tubes shall not deviate from straightness by more than 1/1 000 of any length, when measured at the centre of that length, at the manufacturer's works.

16. LENGTH

16.1 The tubes shall be supplied in random lengths of 4 to 7 metres unless otherwise agreed to between the manufacturer and the purchaser.

16.2 Where 'exact' or 'cut length' is specified, it shall be within the tolerance of $^{+\ 6}_{-\ 0}$ mm.

17. SURFACE PROTECTION

17.1 Unless otherwise specified, the tubes shall be supplied with protective coating by rust preventive oil on the outside surface.

18. MARKING

18.1 Each tube may be marked with the manufacturer's name or trade-mark.

18.2 Each bundle of tubes shall be marked suitably with the following:

a) Type of pipe,

b) Grade of material, and

c) Outside diameter and thickness.

18.2.1 Each tube may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

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